

REMARKS

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111, and in light of the remarks which follow, are respectfully requested.

By the foregoing amendments, claim 11 has been amended to replace the phrase "a graft-modified product of unsaturated carboxylic acid" with --a graft-modified product with unsaturated carboxylic acid--. In addition, claim 11 has been amended to replace the phrase "modification of the graft modified ethylene polymer" with ---graft-modification--, and to replace the phrase "and the ethylene polymer before modification has" with --having--. Claim 16 has been amended to delete the phrase "wherein the amounts of (BB), (E) and (F) are based on 100 parts by weight of (AA)" after "alcohol". Claims 11 and 13-21 remain pending in the application.

In the Official Action, claim 11 and 13-21 were objected to for the reasons set forth in paragraph (2) thereof. Withdrawal of these objections is respectfully requested in view of the above amendments which comply with the Examiner's suggestions.

Claims 11 and 13-15 were rejected under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,232,377 (Hayashi et al) for the reasons set forth in paragraph (4) of the Office Action. Claims 16-21 were rejected under 35 U.S.C. §103(a) as obvious over Japanese Patent Document No. JP 08-176343 (Manabu et al) for the reasons presented in paragraph (5) of the Action. Claims 16-21 also were rejected under §103(a) as obvious over Japanese Patent Document No. JP 09-221567 (Kensho et al) for the reasons discussed in paragraph (6) of the Official Action. Reconsideration and withdrawal of these rejections are requested for at least the following reasons.

US 6,232,377 B1 (hereinafter referred to as Hayashi et al '377) discloses a flame retardant composition comprising (A) about 50-95 wt% of at least one ethylene copolymer, (B) about 5-50 wt% of an ethylene/α-olefin copolymer having specified ranges of melt flow rate, density and Mw/Mn ratio, (C) about 2-50 parts by weight of a polyethylene modified with a functional group containing group, (D) about 5-250 parts by weight of a metal hydrate, (E) about 1-12 parts by weight of a triazine ring containing compound., and. (F) 0.5-5 parts by weight of a flame retardant compound selected from the group consisting of a boron compound, a molybdenum compound, and a silicone, wherein the amounts (C)-(F) are based on 100 parts by weight of components (A) and (B).

Hayashi et al '377 fails to disclose a graft-modified product with unsaturated carboxylic acid or a derivative thereof wherein the ethylene polymer before graft-modification is an ethylene/C₃-C₁₀ α-olefin copolymer having the specific density, melt flow rate and Mw/Mn index set forth in present claim 11. According to this reference, "any polyethylene resin can be used in the modification" (column 5, line 25) and suitable resins include homopolymers and copolymers of ethylene (column 5, lines 26-30). The working Examples use a maleic anhydride modified ethylene/hexene-1 copolymer as the polyethylene modified with a functional group containing group. No physical properties of the unmodified copolymer are disclosed.

The selection of an ethylene/α-olefin copolymer having the specified properties set forth in claim 11 as the backbone polymer for graft modification unexpectedly provides compositions having improved physical properties. Thus, a review of the data in Table 3 on page 36 of the specification shows that the compositions of Examples Y1-1, Y1-2 and Y2, which contain a graft copolymer made using an ethylene/1-butene copolymer having a density, melt flow rate and Mw/Mn index within the scope of claim 11, unexpectedly has a

higher break strength and elongation at break than the compositions of Comparative Examples Y2-1 and Y2-2, where the backbone polymer is a polyethylene having a density outside the range of the present claims. These results could not have been predicted from the disclosure of Hayashi et al '377.

Accordingly, while the disclosure of Hayashi et al '377 encompasses the use of polyethylenes of varying densities as suitable backbone polymers for grafting (column 5, lines 26-30), the data in Table 3 of the present specification shows that such a polyethylene gives inferior results in comparison to ethylene/α-olefin copolymers having the properties recited in claim 11. Hayashi et al '377 does not disclose or suggest that the use of such a copolymer yields compositions which have excellent break strength and elongation at break as shown by the data in Table 3, these compositions being pliant and flexible and particularly suitable as coatings for electric wires.

In view of the foregoing, the §103(a) rejection of claims 11 and 13-15 should be withdrawn. Such action is earnestly requested.

JP08-176343 discloses a flame retardant resin composition containing ammonium polyphosphate, a compound containing polyhydric hydroxyl groups, a compound containing a triazine ring, and a metal hydroxide. JP 09-221567 discloses a flame retardant polyolefin resin composition containing ammonium polyphosphate, a specific amine phosphate or condensed amine phosphate, a nitrogen-containing organic compound and/or a polyhydric alcohol.

As described at page 4, lines 17-27 and. at page 5, lines 6-10 of the specification, polyphosphoric acid absorbs water and gradually reduces electrical resistance due to water absorption and thus is not suitable as an insulating covering material for electric wire/cable, etc. It is an objective of the present invention to provide a polymer composition having high

flame retardancy without a halogen- or phosphorous-based flame retardant, particularly a flame retardant polymer composition suitable as a covering material or sheath for electric wires. Thus, the present invention provides compositions which are not disclosed or suggested in JP '343 or JP '567.

Moreover, the data in Table 4 on page 39 of the specification shows unexpected results. Thus, Example Z2 which satisfies the constitution of present claim 16, when compared with Comparative Example Z7 to which zinc borate is added instead of pentaerythritol, shows that the composition of Example Z2 is superior to that of Comparative Example Z7 in vertical flame test.

Also, comparing Example Z5 containing smaller amounts of flame retardant with Comparative Examples Z9, Z10 and Z11 containing higher amounts of flame retardant, it is apparent that Example Z5 is superior to Comparative Examples Z9, Z10 and Z11 in the vertical flame test.

Accordingly, contrary to the position taken in the Office Action, the amount of hydroxide is important in attaining acceptable flame retardant properties, specifically passing the vertical flame test. This aspect of the present invention is not recognized in the cited Japanese documents. JP '343 discloses a range of hydroxide of 0.1-5 parts by weight which is substantially below the minimum amount given in claim 16. JP '567 discloses no amounts of hydroxide.

In view of the above, the §103 rejections over JP '343 and JP '567 should be reconsidered and withdrawn. Such action is earnestly solicited.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any

questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (703) 838-6683 at her earliest convenience.

Respectfully submitted,

BUCHANAN INGERSOLL PC

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By: George F. Lesmes
George F. Lesmes
Registration No. 19,995

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620